PATENT ABSTRACTS OF JAPAN

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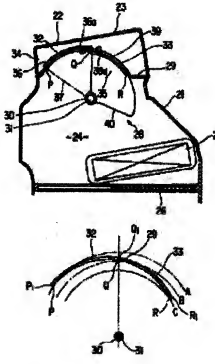
(54) AIR CONDITIONER FOR VEHICLE

(57)Abstract:
PROBLEM TO BE SOLVED: To seal a seal wall and a rotary damper without air leakage at the time of total closing without requiring precision and without spoiling smooth actuation.
SOLUTION: A seal wall 29 is formed by a circular arc passing through three points of a P point, a Q point and an R point at the time when one end side of a circular arc A of the extreme outside is specified as the P point, a central point of an intermediate circular arc B is as the Q point and the other end side of the extreme inside circular arc C the R point out of the three circular arcs A, B, C of a triple cocentric circle FACE/DEF ventilating hole 32, 33 are provided on the seal wall 29, and a FACE rotary damper 34 to rotate with the triple cocentric circle to open and close the DEF ventilating hole as a shaft center is provided on the outside of the seal wall. Additionally, a DEF damper 35 to rotate with the triple cocentri circle to open and close the DEF ventilating hole as a shaft center is provided on the inside of the seal wall, high precision is not required with a behavior of a FACE/DEF rotary damper, a part between the seal wall and the rotary damper is sealed without air leakage at the time of total closing, and the seal surface is revolved without sliding on the seal wall at the time of total opening.



CLAIMS

[Claim(s)]

[Claim 1]An air-conditioner for vehicles characterized by comprising the following which provided an air suction port in the one end side of a casing, and provided the 1st and 2nd outlet that carries out wind distribution of the air which allocated a heat exchanger which absorbs all over an airstream way which results in the other end side, and carries out temperature control of the air, and carried out temperature control to the other end side to the vehicle interior of a room.
A seal wall which intercepts said airstream way in a position close to the outlet between said heat exchanger under said casing and the 1st and 2nd outlet is established, Inside of three circles formed in said seal wall of the Mie concentric circle at equal intervals centering on a point in said casing, When the 2nd point and a point by the side of the other end on a circle by the side of the innermost are made [a point by the side of one end on an outermost circle] into the 3rd point for the 1st point and a point of a center on a middle circle, Form with a circle which passes along these three points, and the 1st and 2nd fresh air inlet is provided in a position which faces said 1st and 2nd outlet of the seal wall, respectively, The 1st rotary damper that has a circular face which is pivotable considering the center of said Mie concentric circle as a shaft center in one fresh air inlet, and opens and closes the fresh air inlet in slide contact with the outside of said seal wall to the 1st and 2nd fresh air inlet.
A circular face which is pivotable considering the center of said Mie concentric circle as a shaft center in a fresh air inlet of another side, and opens and closes the fresh air inlet in slide contact with the inside of said seal wall.

[Claim 2]The air-conditioner for vehicles according to claim 1 which carries out integral moulding of said seal wall to said casing, and is characterized by things.
[Claim 3]The air-conditioner for vehicles according to claim 1 or 2 using an axis which supports said 1st and 2nd rotary damper pivotable, respectively as a double concentric shaft which makes the center of said Mie concentric circle a shaft center.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the air conditioning concomitant use type air-conditioner for vehicles mainly installed and used for vehicles, such as a passenger car.
[0002]
[Description of the Prior Art]The air conditioning concomitant use type air-conditioner being installed in the instrument panel part, and a car (vehicles) using engine heat and refrigerating cycle together generally, and air-conditioning the vehicle interior of a room comfortably is performed.
[0003]As shown in drawing 5 and drawing 6, such an air-conditioner for vehicles in the casing 1, The structure which formed the air mix damper 3 which distributes the heat exchanger called the heater 2 which radiates heat in the evaporator (not shown) of a refrigerating cycle and the heat of engine cooling water, the air which passes the heater 2 further, and the air which bypasses the heater 2 is used.
[0004]And temperature control of the air inhaled from the air suction port (not shown) provided in the end side which the casing 1 does not illustrate is carried out to predetermined with the opening (movement on either side) of the air mix damper 3, It enables it to have blown off from various kinds of outlets, such as the outlet 4 (the 1st outlet) provided in the other end side of the casing 1, for example, a FACE outlet, and the DEF outlet 5 (the 2nd outlet).
[0005]The air which heat exchange was carried out and was cooled in the evaporator specifically, By the operation of the longitudinal direction of the air mix damper 3 which is upstream of the heater 2. it is distributed to the air which passes the heater 2, and the air which bypasses the heater 2 predetermined, and distributing quantity is adjusted, and after it is further joined and mixed in the airstream way portion by the side of the slipstream of the heater 2 and being adjusted by predetermined temperature, it blows off from various kinds of outlets.
[0006]In such an air-conditioner for vehicles, in order to make the air by which temperature control was carried out usually blow off to the outlet empty vehicle interior of a room in the part of a request of the body, the channel switching arrangement 7 is formed in the flow channel part between the heater 2, the outlet 4, for example, a FACE outlet, and the DEF outlet 5.
[0007]Generally, the structure using a tabular damper is adopted (not shown). However, in case of the structure using this tabular damper, structure is complicated and also there is a difficulty that resistance of the airstream way in the casing 1 is strong.
[0008]Then, as shown in drawing 5 and drawing 6, structure becomes easy and the channel switching arrangement 7 using the rotary damper 8 with an advantage, like resistance of an airstream way is small and ends is proposed.
[0009]This turns the circle side to the outlet side, and establishes the seal case 9 of an

approximately semi-cylindrical shape so that the part may be covered into the airstream way portions [directly under] of the FACE outlet 4 and the DEF outlet 5 arranged in parallel, and the structure which combined the rotary damper 8 with this seal case 9 is used.

[0010]In detail, a both-ends surface wall sticks the seal case 9 to the medial surface of the casing 1, and it has fixed with the fasteners 10, such as a screw thread, so that there may be no wind leak between the inner surface of KESHINNGU 1, and the outside surface of the seal case 9.

[0011]The lower aperture of the seal case 9 is wide opened all over the airstream way by the side of the heater 2, and is made into the inflow passage, and the whole quantity of the air adjusted by predetermined temperature is made to be sent in into the seal case 9.

[0012]And the FACE fresh air inlet 11 and the DEF fresh air inlet 12 are drilled in the portion which faces the FACE outlet 4 and the DEF outlet 5 after the circular arc wall of this seal case 9.

[0013]Inside such a seal case 9, the rotary damper 8 which made the flabellate form in which the inner surface of the seal case 9 and a slide contact are free is combined. . Namely, the rotary damper 8 touches the inner surface of the circular arc wall of the seal case 9. Touching the end face wall of the seal case 9 from the circular arc wall 15 which formed the circular arc shape of the seal case 9, and the circular face form of the concentric circle, and the both ends of this circular arc wall 15. It extends in the center side, and an end has with the end face wall 16 fixed to the driving shaft 14 inserted in the part used as the same shaft center as the circular arc wall of the seal case 9, and is constituted.

[0014]By this, if the rotary damper 8 rotates the driving shaft 14, while the circular arc wall 15 slides on the inner surface of the circular arc wall of the seal case 9, rotational displacement of it will be carried out, The FACE fresh air inlet 11 or the DEF fresh air inlet 12 is opened and closed, or both the FACE(s) fresh air inlet 11 and the DEF fresh air inlet 12 are blockaded, and it has been made to be carried out in the channel change by the side of blow off.

[0015]The FACE fresh air inlet 11 is passed for the air sent into the seal case 9, and he passes the DEF fresh air inlet 12, and is trying to make it blow off from the FACE outlet 4 from the DEF outlet 5 to the vehicle interior of a room with this channel change.

[0016]Namely, if the damper sealing surface 14a which makes rotate the rotary damper 8 rightward on a figure via the driving shaft 14 from the position shown in drawing 5, and is formed by the inner surface of the circular arc wall 15 stops now in the position which passed the FACE fresh air inlet 11 thoroughly, Between the inside of the seal case 9, and the FACE outlet 4 of the casing 1, the air course which leads the FACE fresh air inlet 11 is formed, and the air which results in the seal case 9 blows off to the FACE outlet 4 empty-vehicle interior of a room.

[0017]If the rotary damper 8 is similarly rotated leftward on a figure from the position shown in drawing 5 and the damper sealing surface 14a stops the DEF fresh air inlet 12 in the position passed thoroughly, Between the inside of the seal case 9, and the DEF outlet 5 of the casing 1, the air course which leads the DEF fresh air inlet 12 is formed, and the air which results in the seal case 9 blows off to the DEF outlet 5 empty-vehicle interior of a room.

[0018]By the way, the air-conditioner carried in vehicles is the rotary damper 8, and does not have between the rotary damper 8 and the seal cases 9 to a wind leak, and carrying out full close of the outlet 11, i.e., a FACE fresh air inlet, and the DEF outlet 5 is called for.

[0019]Then, in order to prevent the wind leak from the crevice between the rotary damper 8 and the seal case 9 in the former, As the crevice is made as small as possible or it is shown in drawing 7, the sealing member 17 (******** etc. are used) which touches the circular arc wall inner surface of the seal case 9 is formed in sealing surfaces, such as a both-sides end of the circular arc wall 14 of the rotary damper 8, Controlling that a wind leaks from the crevice between the rotary damper 8 and the seal case 9 is performed in the full-close state of the FACE fresh air inlet 11 and the DEF outlet 5.

[0020]

[Problem(s) to be Solved by the Invention]However, it is required that the former structure should keep small the crevice between the seal case 9 and the rotary damper 8. For this reason, there was a difficulty that it is difficult to maintain processings of the Ryobe article and such assembling precision.

[0021]On the other hand, although the result with the latter structure good in the measure against a crevice is obtained, since the sealing member 17 is in contact with the circular arc wall of the seal case 9, the operation of the rotary damper 13 always becomes heavy easily with remarkable resistance at movement of the rotary damper 8.

[0022]For this reason, the operativity of the rotary damper 8 is spoiled, namely, there is a difficulty that the smooth drive of the rotary damper 8 is spoiled, and what can improve such fault is demanded.

[0023]The place which this invention was made paying attention to the above-mentioned situation, and is made into the purpose, It is in providing the air-conditioner for vehicles which can change the seal of a seal case and the rotary damper into the state where there is no wind leak in a full-close state, without not needing high processing and assembling precision, and spoiling the smooth operation of a rotary damper.

[0024]

[Means for Solving the Problem]To achieve the above objects, an invention indicated to Claim 1, A seal wall which intercepts an airstream way established in a position close to the outlet between a heat exchanger under casing, and the 1st and 2nd outlet, When the 2nd point and a point by the side of the other end on a circle by the side of the innermost are made [a point by the side of one end on an outermost circle] into the 3rd point for the 1st point and a point of a center on a middle circle among three circles formed of the Mie concentric circle at equal intervals centering on a point in a casing, Form with a circle which passes along these three points, provide the 1st and 2nd fresh air inlet in a position which faces the 1st and 2nd outlet of the seal wall, respectively, and are pivotable considering the center of the Mie concentric circle as a shaft center in one fresh air inlet to the 1st and 2nd fresh air inlet, And are pivotable considering the center of the Mie concentric circle as a shaft center in the 1st rotary damper that has a circular face which opens and closes the fresh air inlet in slide contact with the outside of a seal wall, and a fresh air inlet of another side, And it is in having had composition which installed the 2nd rotary damper that has a circular face which opens and closes the fresh air inlet in slide contact with the inside of a seal wall.

[0025]As opposed to a seal wall which makes the shape of a circle which intersects a concentric circle arc of Mie according to the invention according to claim 1, Since the 1st rotary damper of the outside of a seal wall is rotatable considering the center of the Mie concentric circle as a shaft center, if the 1st rotary damper in a fully closed position is operated to the open side, While a sealing surface of the damper separates from lateral surface of a seal wall, rotational displacement is carried out to an open position, and one through-hole is made to open wide.

[0026]Since a sealing surface will carry out field contact and will stick to lateral surface of a seal wall from a method of outside shortly if the 1st rotary damper is returned to an open position, a through-hole is closed without a crevice (full close). And the 1st rotary bumper stops at the fully closed position, and maintains the state where there is no crevice between seal walls.

[0027]On the other hand, when the 2nd rotary damper in a fully closed position is operated to the open side, while a sealing surface separates from a medial surface of a seal wall, rotational displacement of the damper is carried out to an open position, and it makes a through-hole of another side open wide.

[0028]Since a sealing surface will carry out field contact and will stick to a medial surface of a seal wall from an inner direction shortly if the 2nd rotary damper is returned to a fully closed position, a

through-hole is closed without a crevice (full close). And the 2nd rotary bumper stops at the fully closed position, and maintains the state where there is no crevice between seal walls.

[0029]It comes change the seal of between a seal wall and rotary dampers into the state where there is no wind leak, in a full-close state by an action of such 1st and 2nd rotary damper, without needing high processing and assembling precision of parts.

[0030]And since each rotary damper rotates without a sealing surface's separating from a seal wall thoroughly, and sliding with rotation, i.e., a seal wall, (contact) when moving to the full admission side, there is no addition of frictional resistance and a smooth operation is promised.

[0031]In order to attain simplification of damper structure in addition to the above-mentioned purpose, having carried out integral moulding of the seal wall according to claim 1 to a casing has an invention indicated to Claim 2. In order to attain simplification of the supporting structure of the 1st and 2nd rotary damper in addition to the above-mentioned purpose, having constituted an axis which supports the 1st and 2nd rotary damper according to claim 1 or 2 pivotable, respectively from a double concentric shaft which makes the center of the Mie concentric circle a shaft center has an invention indicated to ****** 3.

[0032]

[Embodiment of the Invention]Hereafter, this invention is explained based on one embodiment shown in drawing 1 thru/or drawing 4. The sectional side elevation of the circumference of the blow-off system of the air-conditioner for vehicles with which drawing 1 applied this invention, and drawing 2 show drawing of longitudinal section of the part, respectively, and 21 in a figure is a casing of the air-conditioner installed in the instrument panel part (not shown) of a car.

[0033]The casing 21 is formed in case shape, for example, and the air suction port is provided in the lower part [which becomes the end side] side which is not illustrated with the centrifugal fan (neither is illustrated). The outlet for carrying out wind distribution of the air which carried out temperature control to the vehicle interior of a room, for example, the FACE outlet 22 as the 1st outlet and the DEF outlet 23 as the 2nd outlet, is installed side by side by the upper wall which becomes the other end the casing 21 side.

[0034]And the airstream way 24 which opens between an air suction port, and the FACE outlets 22 and the DEF outlets 23 for free passage inside the casing 21 is formed. All over this airstream way 24, the evaporator of the air suction port side to a refrigerating cycle (not shown), The air mix damper 26 which distributes the heat exchanger called the heater 25 which radiates heat in the heat of engine cooling water, the air which passes the heater 25, and the air which bypasses the heater 25 is formed.

[0035]On the flow channel part between the heater 25 and the outlets 22 and 23, and a concrete target, directly under the outlets 22 and 23, The rotary damper-type channel switching arrangement 28 is formed and it enables it to blow off the air in which temperature control was carried out to predetermined by the opening of the air mix damper 26 to the FACE outlet 22 and the DEF outlet 23 empty-vehicle interior of a room.

[0036]This invention is applied to this channel switching arrangement 28. If the structure of this channel switching arrangement 28 is explained, 29 in a figure will be the seal wall which made the approximately semi-cylindrical shape.

[0037]As for the seal wall 29, toward the outlet side, the circle side is arranged so that the opening side may approach with the FACE outlet 22 and the DEF outlet 23 toward the heater 26 side. The periphery of this seal wall 29 is following the peripheral wall of the casing 21, and one, for example, and has interrupted the airstream way 24. That is, integral moulding of the seal wall 29 has been carried out to the casing 1.

[0038]Special arc shape is set to this seal wall 29. The arc shape which specifically passes circle PQR as shown in drawing 3 is made.

[0039]Namely, the double concentric shaft which has penetrated both the wall portions 21a and 21b of the casing 1 as for which circle PQR serves as the heater 25 upper part as is shown in the existing point, for example, drawing 1, and drawing 2 in KESHISHINGU 1 along with the longitudinal direction of the seal wall 29, For example, the three imaginary circle arcs A, B, and C formed of the Mie concentric circle of abbreviation regular intervals centering on the axial center of the driving shaft 31 (the 2nd) which has inserted in slidably the driving shaft 30 (the 1st) in the air and the driving shaft 30 are drawn, Among these, the point by the side of the end on the outermost circle A, for example, the point used as the end by the side of a FACE outlet, is determined as P point (the 1st point), On the middle circle B, the part used as a central point is appointed at Q point (the 2nd point), the point by the side of the other end on the circle C by the side of the innermost, for example, the point used as the end by the side of a DEF outlet, is determined as R, and it has formed with the circle which passes along these three point PQR.

[0040]That is, circle PQR is making the special shape which intersects the concentric circle arc A, B, and C at each PQR point. In this way, the FACE fresh air inlet 32 (equivalent to the 1st fresh air inlet) is formed in the position which faces the constituted seal wall 29 with the FACE outlet 22, The DEF fresh air inlet 33 (equivalent to the 2nd fresh air inlet) is formed in the position which faces the DEF outlet 23, and the ventilation flue which leads the air which reached the seal wall 29 to the FACE outlet 22 and the DEF outlet 23 is formed.

[0041]And the FACE rotary damper 34 (equivalent to the 1st rotary damper) which opens and closes the FACE fresh air inlet 32 is formed in the outside of this seal wall 29, and, inside, the DEF rotary damper 35 (equivalent to the 2nd rotary damper) which opens and closes the DEF fresh air inlet 33 is formed in it.

[0042]The FACE rotary damper 34 has the circular arc wall 36 with the circular face learned from the arc shape of the outside surface of the seal wall 29 which has the FACE fresh air inlet 32 as shown in drawing 4 (b), The inner surface of this circular arc wall 36 contacts along the outside surface of the seal wall 29, and is shielding the FACE fresh air inlet 32. The damper sealing surface 36a of the circular face close to the outside surface of the seal wall 29 is formed in the inner surface of the circular arc wall 36.

[0043]And the circular arc wall 36 is connected with the driving shaft 30 slidably fitted in the outside surface of the driving shaft 31 via one wall 37 of the casing 21, for example, the end face wall which penetrate the end part of the seal wall 29 slidably, and is prolonged below over the inner surface of the wall portion 21a.

[0044]That is, the FACE rotary damper 34 has supported the center of the Mie concentric circle A, B, and C pivotable as a shaft center. And if the rotary damper 34 which is in a fully closed position according to this damper structure with the lever 38 which is in the end of the driving shaft 30, for example is rotated to an open side, i.e., right-hand side, As shown in drawing 4 (a), according to a difference with the crossing arc shape, concentric circle shape and each part of the Mie same mind. While the damper sealing surface 36a of the rotary damper 34 moves in the direction which deserts the outside surface (lateral surface) of the seal wall 29, carry out rotational displacement to an open position (right side end), and the FACE fresh air inlet 32 is opened wide, If it returns to a fully closed position, it will be made to have been obtained in the action which the damper sealing surface 36a carries out field contact (slide contact) to the outside surface of the seal wall 29 in accordance with the arc shape of the seal wall 29 from the outside, and blockades the FACE fresh air inlet 32.

[0045]The DEF rotary damper 35 has the circular arc wall 39 which has a circular face learned from the arc shape of the inner surface of the seal wall 29 with the DEF fresh air inlet 33, as shown in drawing 4 (b), and the outside surface of this circular arc wall 39 contacts the inner surface of the seal wall 29, and is shielding the DEF fresh air inlet 33. The damper sealing surface 39a of the

circular arc shape close to the outside surface of the seal wall 29 is formed in the outside surface of the circular arc wall 39.

[0046]And the circular arc wall 39 is connected with the driving shaft 31 currently supported by the boss section 42 enabling free rotation via the wall 40 of another side of the casing 21, for example, the end face wall prolonged below over the inner surface of the wall portion 29b of the seal wall 29.

[0047]That is, the DEF rotary damper 35 has supported the center of the Mie concentric circle A, B, and C pivotable as a shaft center. And if the rotary damper 34 which is in a fully closed position according to this damper structure with the lever 41 which is in the end of the driving shaft 31, for example is rotated to an open side, i.e., left-hand side, As shown in drawing 4 (c), according to a difference with the crossing arc shape, each part of concentric circle shape and the Mie concentric circle. While the damper sealing surface 39a of the rotary damper 34 moves in the direction which deserts the inner surface (medial surface) of the seal wall 29, carry out rotational displacement to an open position (left side end), and the DEF fresh air inlet 33 is opened wide, If it returns to a fully closed position (right side end), it will be made to have been obtained in the action which the damper sealing surface 39a carries out field contact (slide contact) to the inner surface of the seal wall 29 in accordance with the arc shape of the seal wall 29 from the inside, and blockades the DEF fresh air inlet 33.

[0048]Below, an operation of the air-conditioner for vehicles constituted in this way is explained. Suppose that air was introduced from the air suction port which is not illustrated now. By then, the air mix damper 26 which is in the upstream part of the heater 25 after carrying out heat exchange to the evaporator which this air is fed with the centrifugal fan which is not illustrated, and is not illustrated and being cooled. It is distributed to the air heated by passing the heater 25 (based on heat exchange), and the air which bypasses the heater 25.

[0049]The air shunted toward this cooling air and heated air joins in the airstream way portion of the slipstream of the heater 25, is adjusted to a predetermined temperature, and is introduced in the seal wall 29. And this air by which temperature control was carried out blows off through the channel switching arrangement 28 to various kinds of outlets 22, i.e., a FACE outlet, and the DEF outlet 23 empty-vehicle interior of a room.

[0050]That is, when making temperature control air blow off to the FACE outlet 22 empty-vehicle interior of a room, the RRC of the driving shaft 30 is carried out on a figure from the full-close state of the FACE fresh air inlet 32 shown in drawing 1, drawing 2, and drawing 4 (b).

[0051]Then, rotation displacement of the circular arc wall 36 of the FACE rotary damper 34 which touches external wall surface P_1Q_1 of the seal wall 29 as shown in drawing 4 (b) is carried out a center [the axial center of the driving shaft 30].

[0052]Specifically, rotational displacement of the circular arc wall 36 of the FACE rotary damper 34 is carried out, drawing the direction which separates outside to circle PQR which intersects the concentric circle arc A, B, and C of Mie.

[0053]So, as shown in drawing 4 (a), while the damper sealing surface 36a separates from external wall surface P_1Q_1 of the seal wall 29, rotational displacement of the FACE rotary damper 34 is carried out to an open position.

[0054]Thereby, the air by which the FACE fresh air inlet 32 of the seal wall 29 was in the opened state without the air resistance by the FACE rotary damper 34, and was opened wide, and temperature control was carried out blows off to the FACE outlet 22 empty-vehicle interior of a room through the fresh air inlet 32.

[0055]If the RLC of the driving shaft 30 is shortly carried out on a figure, the damper sealing surface 36a of the FACE rotary damper 32 will return from this position to external wall surface P_1Q_1 of the seal wall 29.

[0056]Since the seal wall 29 is making circle PQR ($P_1Q_1R_1$) which intersects the Mie concentric circle A, B, and C at this time, The locus of tip P_2 of the damper sealing surface 36a which moves in the concentric circle A top crosses at the P_1 point of the seal wall 29 from the outside, and the locus of tip Q_2 of the damper sealing surface 36a which similarly moves in the concentric circle B top crosses at the Q_1 point of the seal wall 29 from the outside.

[0057]That is, from the method of outside, the damper sealing surface 36a carries out field contact, and sticks the returning FACE rotary damper 34 to the lateral surface of the seal wall 29. Thereby, since the FACE rotary damper 34 in a fully closed position contacts without the crevice between 29 seal wall, the FACE fresh air inlet 32 is closed without a crevice (full close).

[0058]And the FACE rotary bumper 34 stops at the fully closed position, maintains the state which does not have a crevice between the seal walls 29, i.e., the state where there is no wind leak from the FACE fresh air inlet 32, and stops blow off.

[0059]When making temperature control air blow off to the DEF outlet 23 empty-vehicle interior of a room, the RLC of the driving shaft 31 is carried out on a figure from the full-close state of the DEF fresh air inlet 33 shown in drawing 1 and drawing 2.

[0060]Then, rotation displacement of the circular arc wall 39 of the DEF rotary damper 35 which touches the external wall surface QR of the seal wall 29 as shown in drawing 4 (b) is carried out a center [the axial center of the driving shaft 31].

[0061]Specifically, rotational displacement of the circular arc wall 39 of the DEF rotary damper 35 is carried out, drawing the direction which separates inside to circle PQR which intersects the concentric circle arc A, B, and C of Mie.

[0062]So, as shown in drawing 4 (c), while the sealing surface 39a separates from the internal surface QR of the seal wall 29, rotational displacement of the DEF rotary damper 35 is carried out to an open position. Thereby, the air by which the DEF fresh air inlet 33 of the seal wall 29 was in the opened state without the air resistance by the DEF rotary damper 35, and was opened wide, and temperature control was carried out blows off to the DEF outlet 23 empty-vehicle interior of a room through the fresh air inlet 33.

[0063]If the RRC of the driving shaft 31 is shortly carried out on a figure, the damper sealing surface 39a of the DEF rotary damper 35 will return from this position to the external wall surface QR of the seal wall 29.

[0064]Since the seal wall 29 is making circle PQR which intersects the Mie concentric circle A, B, and C at this time, The locus of back end Q_3 of the damper sealing surface 39a which moves in the concentric circle B top like the case of the FACE rotary damper 34, Crossing at Q point of the seal wall 29 from the inside, the locus of tip R_3 of the damper sealing surface 39a which similarly moves in the concentric circle C top crosses at R point of the seal wall 29 from the inside.

[0065]That is, from an inner direction, the damper sealing surface 39a carries out field contact, and sticks the returning DEF rotary damper 35 to the medial surface of the seal wall 29. Thereby, since the DEF rotary damper 35 in a fully closed position contacts without the crevice between 29 seal wall, the DEF fresh air inlet 33 is closed without a crevice (full close).

[0066]And the DEF rotary bumper 35 stops at the fully closed position, maintains the state which does not have a crevice between the seal walls 29, i.e., the state where there is no wind leak from the DEF fresh air inlet 33, and stops blow off.

[0067]Thus, the opening and closing structure using the action of the rotary dampers 34 and 35 which carries out rotational displacement to the circle of the seal wall 29 in the direction which crosses or deserts by adoption. The full-close state which does not have a crevice in the FACE fresh air inlet 32 and the DEF fresh air inlet 33 by direct contact with the seal wall 29 can be

maintained.

[0068]As a result, a seal is changed into the state where there is no wind leak, without needing high processing and assembling precision of parts. And since each rotary dampers 34 and 35 rotate without the damper sealing surfaces' 36a and 39a separating from the seal wall 29 thoroughly in the operation process to full admission, and sliding in the rotation 29, i.e., a seal wall, (contact), There is no addition of frictional resistance, a smooth operation is promised and a smooth drive and operation of each efficient rotary dampers 34 and 35 are attained.

[0069]Simplification of damper structure can be attained by having carried out integral moulding of the seal wall 29 to the casing 1. In addition, since the shank (axis) which supports the FACE rotary damper 34 and the DEF rotary damper 35 pivotable, respectively was constituted from the double concentric shafts 30 and 31 which make a shaft center the center of the Mie concentric circle A, B, and C, simplification of the supporting structure of both the rotary dampers 34 and 35 can be attained.

[0070]Although this invention was applied to the air-conditioner for vehicles which has a FACE outlet and a DEF outlet in one embodiment mentioned above, this invention may be applied to the air-conditioner for vehicles which has the air-conditioner for vehicles which has not only this but the other outlet, for example, FOOT ******** etc.

[0071]

[Effect of the Invention]As explained above, according to the invention according to claim 1, to the seal wall of a circular arc shape by the action of the 1st and 2nd rotary damper that moves in the direction which crosses or deserts. The seal of between a seal wall and rotary dampers is changed into the state where there is no wind leak, in a full-close state, without needing high processing and assembling precision of parts.

[0072]And when moving to the full admission side, each rotary damper. Since it rotates without a sealing surface's separating from a seal wall thoroughly, and sliding with rotation, i.e., a seal wall, (contact), there is no addition of frictional resistance, a smooth operation is promised, a rotary damper can be operated smoothly, and operation with the sufficient efficiency of the rotary damper is attained.

[0073]According to the invention according to claim 2, in addition to the effect of the invention of Claim 1, the effect that simplification of damper structure can be attained is done so. According to the invention according to claim 3, in addition to the effect of the invention of Claim 1 or Claim 2, the effect that simplification of the supporting structure of the 1st and 2nd rotary damper can be attained is done so.

[Translation done.]

TECHNICAL FIELD

[Field of the Invention]This invention relates to the air conditioning concomitant use type air-conditioner for vehicles mainly installed and used for vehicles, such as a passenger car.

[Translation done.]

PRIOR ART

[Description of the Prior Art]The air conditioning concomitant use type air-conditioner being installed in the instrument panel part, and a car (vehicles) using engine heat and refrigerating cycle together generally, and air-conditioning the vehicle interior of a room comfortably is performed.
[0003]As shown in drawing 5 and drawing 6, such an air-conditioner for vehicles in the casing 1, The structure which formed the air mix damper 3 which distributes the heat exchanger called the heater 2 which radiates heat in the evaporator (not shown) of a refrigerating cycle and the heat of engine cooling water, the air which passes the heater 2 further, and the air which bypasses the heater 2 is used.
[0004]And temperature control of the air inhaled from the air suction port (not shown) provided in the end side which the casing 1 does not illustrate is carried out to predetermined with the opening (movement on either side) of the air mix damper 3, It enables it to have blown off from various kinds of outlets, such as the outlet 4 (the 1st outlet) provided in the other end side of the casing 1, for example, a FACE outlet, and the DEF outlet 5 (the 2nd outlet).
[0005]The air which heat exchange was carried out and was cooled in the evaporator specifically, By the operation of the longitudinal direction of the air mix damper 3 which is upstream of the heater 2. it is distributed to the air which passes the heater 2, and the air which bypasses the heater 2 predetermined, and distributing quantity is adjusted, and after it is further joined and mixed in the airstream way portion by the side of the slipstream of the heater 2 and being adjusted by predetermined temperature, it blows off from various kinds of outlets.
[0006]In such an air-conditioner for vehicles, in order to make the air by which temperature control was carried out usually blow off to the outlet empty vehicle interior of a room in the part of a request of the body, the channel switching arrangement 7 is formed in the flow channel part between the heater 2, the outlet 4, for example, a FACE outlet, and the DEF outlet 5.
[0007]Generally, the structure using a tabular damper is adopted (not shown). However, in case of the structure using this tabular damper, structure is complicated and also there is a difficulty that resistance of the airstream way in the casing 1 is strong.
[0008]Then, as shown in drawing 5 and drawing 6, structure becomes easy and the channel switching arrangement 7 using the rotary damper 8 with an advantage, like resistance of an airstream way is small and ends is proposed.
[0009]This turns the circle side to the outlet side, and establishes the seal case 9 of an approximately semi-cylindrical shape so that the part may be covered into the airstream way portions [directly under] of the FACE outlet 4 and the DEF outlet 5 arranged in parallel, and the structure which combined the rotary damper 8 with this seal case 9 is used.
[0010]In detail, a both-ends surface wall sticks the seal case 9 to the medial surface of the casing 1, and it has fixed with the fasteners 10, such as a screw thread, so that there may be no wind leak

between the inner surface of KESHINNGU 1, and the outside surface of the seal case 9.
[0011]The lower aperture of the seal case 9 is wide opened all over the airstream way by the side of the heater 2, and is made into the inflow passage, and the whole quantity of the air adjusted by predetermined temperature is made to be sent in into the seal case 9.
[0012]And the FACE fresh air inlet 11 and the DEF fresh air inlet 12 are drilled in the portion which faces the FACE outlet 4 and the DEF outlet 5 after the circular arc wall of this seal case 9.
[0013]Inside such a seal case 9, the rotary damper 8 which made the flabellate form in which the inner surface of the seal case 9 and a slide contact are free is combined. . Namely, the rotary damper 8 touches the inner surface of the circular arc wall of the seal case 9. Touching the end face wall of the seal case 9 from the circular arc wall 15 which formed the circular arc shape of the seal case 9, and the circular face form of the concentric circle, and the both ends of this circular arc wall 15. It extends in the center side, and an end has with the end face wall 16 fixed to the driving shaft 14 inserted in the part used as the same shaft center as the circular arc wall of the seal case 9, and is constituted.
[0014]By this, if the rotary damper 8 rotates the driving shaft 14, while the circular arc wall 15 slides on the inner surface of the circular arc wall of the seal case 9, rotational displacement of it will be carried out, The FACE fresh air inlet 11 or the DEF fresh air inlet 12 is opened and closed, or both the FACE(s) fresh air inlet 11 and the DEF fresh air inlet 12 are blockaded, and it has been made to be carried out in the channel change by the side of blow off.
[0015]The FACE fresh air inlet 11 is passed for the air sent into the seal case 9, and he passes the DEF fresh air inlet 12, and is trying to make it blow off from the FACE outlet 4 from the DEF outlet 5 to the vehicle interior of a room with this channel change.
[0016]Namely, if the damper sealing surface 14a which makes rotate the rotary damper 8 rightward on a figure via the driving shaft 14 from the position shown in drawing 5, and is formed by the inner surface of the circular arc wall 15 stops now in the position which passed the FACE fresh air inlet 11 thoroughly, Between the inside of the seal case 9, and the FACE outlet 4 of the casing 1, the air course which leads the FACE fresh air inlet 11 is formed, and the air which results in the seal case 9 blows off to the FACE outlet 4 empty-vehicle interior of a room.
[0017]If the rotary damper 8 is similarly rotated leftward on a figure from the position shown in drawing 5 and the damper sealing surface 14a stops the DEF fresh air inlet 12 in the position passed thoroughly, Between the inside of the seal case 9, and the DEF outlet 5 of the casing 1, the air course which leads the DEF fresh air inlet 12 is formed, and the air which results in the seal case 9 blows off to the DEF outlet 5 empty-vehicle interior of a room.
[0018]By the way, the air-conditioner carried in vehicles is the rotary damper 8, and does not have between the rotary damper 8 and the seal cases 9 to a wind leak, and carrying out full close of the outlet 11, i.e., a FACE fresh air inlet, and the DEF outlet 5 is called for.
[0019]Then, in order to prevent the wind leak from the crevice between the rotary damper 8 and the seal case 9 in the former, As the crevice is made as small as possible or it is shown in drawing 7, the sealing member 17 (******** etc. are used) which touches the circular arc wall inner surface of the seal case 9 is formed in sealing surfaces, such as a both-sides end of the circular arc wall 14 of the rotary damper 8, Controlling that a wind leaks from the crevice between the rotary damper 8 and the seal case 9 is performed in the full-close state of the FACE fresh air inlet 11 and the DEF outlet 5.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention]As explained above, according to the invention according to claim 1, to the seal wall of a circular arc shape by the action of the 1st and 2nd rotary damper that moves in the direction which crosses or deserts. The seal of between a seal wall and rotary dampers is changed into the state where there is no wind leak, in a full-close state, without needing high processing and assembling precision of parts.
[0072]And when moving to the full admission side, each rotary damper. Since it rotates without a sealing surface's separating from a seal wall thoroughly, and sliding with rotation, i.e., a seal wall, (contact), there is no addition of frictional resistance, a smooth operation is promised, a rotary damper can be operated smoothly, and operation with the sufficient efficiency of the rotary damper is attained.
[0073]According to the invention according to claim 2, in addition to the effect of the invention of Claim 1, the effect that simplification of damper structure can be attained is done so. According to the invention according to claim 3, in addition to the effect of the invention of Claim 1 or Claim 2, the effect that simplification of the supporting structure of the 1st and 2nd rotary damper can be attained is done so.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, it is required that the former structure should keep small the crevice between the seal case 9 and the rotary damper 8. For this reason, there was a difficulty that it is difficult to maintain processings of the Ryobe article and such assembling precision.

[0021]On the other hand, although the result with the latter structure good in the measure against a crevice is obtained, since the sealing member 17 is in contact with the circular arc wall of the seal case 9, the operation of the rotary damper 13 always becomes heavy easily with remarkable resistance at movement of the rotary damper 8.

[0022]For this reason, the operativity of the rotary damper 8 is spoiled, namely, there is a difficulty that the smooth drive of the rotary damper 8 is spoiled, and what can improve such fault is demanded.

[0023]The place which this invention was made paying attention to the above-mentioned situation, and is made into the purpose, It is in providing the air-conditioner for vehicles which can change the seal of a seal case and the rotary damper into the state where there is no wind leak in a full-close state, without not needing high processing and assembling precision, and spoiling the smooth operation of a rotary damper.

[Translation done.]

MEANS

[Means for Solving the Problem]To achieve the above objects, an invention indicated to Claim 1, A seal wall which intercepts an airstream way established in a position close to the outlet between a heat exchanger under casing, and the 1st and 2nd outlet, When the 2nd point and a point by the side of the other end on a circle by the side of the innermost are made [a point by the side of one end on an outermost circle] into the 3rd point for the 1st point and a point of a center on a middle circle among three circles formed of the Mie concentric circle at equal intervals centering on a point in a casing, Form with a circle which passes along these three points, provide the 1st and 2nd fresh air inlet in a position which faces the 1st and 2nd outlet of the seal wall, respectively, and are pivotable considering the center of the Mie concentric circle as a shaft center in one fresh air inlet to the 1st and 2nd fresh air inlet, And are pivotable considering the center of the Mie concentric circle as a shaft center in the 1st rotary damper that has a circular face which opens and closes the fresh air inlet in slide contact with the outside of a seal wall, and a fresh air inlet of another side, And it is in having had composition which installed the 2nd rotary damper that has a circular face which opens and closes the fresh air inlet in slide contact with the inside of a seal wall.
[0025]As opposed to a seal wall which makes the shape of a circle which intersects a concentric circle arc of Mie according to the invention according to claim 1, Since the 1st rotary damper of the outside of a seal wall is rotatable considering the center of the Mie concentric circle as a shaft center, if the 1st rotary damper in a fully closed position is operated to the open side, While a sealing surface of the damper separates from lateral surface of a seal wall, rotational displacement is carried out to an open position, and one through-hole is made to open wide.
[0026]Since a sealing surface will carry out field contact and will stick to lateral surface of a seal wall from a method of outside shortly if the 1st rotary damper is returned to an open position, a through-hole is closed without a crevice (full close). And the 1st rotary bumper stops at the fully closed position, and maintains the state where there is no crevice between seal walls.
[0027]On the other hand, when the 2nd rotary damper in a fully closed position is operated to the open side, while a sealing surface separates from a medial surface of a seal wall, rotational displacement of the damper is carried out to an open position, and it makes a through-hole of another side open wide.
[0028]Since a sealing surface will carry out field contact and will stick to a medial surface of a seal wall from an inner direction shortly if the 2nd rotary damper is returned to a fully closed position, a through-hole is closed without a crevice (full close). And the 2nd rotary bumper stops at the fully closed position, and maintains the state where there is no crevice between seal walls.
[0029]It comes change the seal of between a seal wall and rotary dampers into the state where there is no wind leak, in a full-close state by an action of such 1st and 2nd rotary damper, without needing high processing and assembling precision of parts.

[0030]And since each rotary damper rotates without a sealing surface's separating from a seal wall thoroughly, and sliding with rotation, i.e., a seal wall, (contact) when moving to the full admission side, there is no addition of frictional resistance and a smooth operation is promised.
[0031]In order to attain simplification of damper structure in addition to the above-mentioned purpose, having carried out integral moulding of the seal wall according to claim 1 to a casing has an invention indicated to Claim 2. In order to attain simplification of the supporting structure of the 1st and 2nd rotary damper in addition to the above-mentioned purpose, having constituted an axis which supports the 1st and 2nd rotary damper according to claim 1 or 2 pivotable, respectively from a double concentric shaft which makes the center of the Mie concentric circle a shaft center has an invention indicated to ****** 3.
[0032]
[Embodiment of the Invention]Hereafter, this invention is explained based on one embodiment shown in drawing 1 thru/or drawing 4. The sectional side elevation of the circumference of the blow-off system of the air-conditioner for vehicles with which drawing 1 applied this invention, and drawing 2 show drawing of longitudinal section of the part, respectively, and 21 in a figure is a casing of the air-conditioner installed in the instrument panel part (not shown) of a car.
[0033]The casing 21 is formed in case shape, for example, and the air suction port is provided in the lower part [which becomes the end side] side which is not illustrated with the centrifugal fan (neither is illustrated). The outlet for carrying out wind distribution of the air which carried out temperature control to the vehicle interior of a room, for example, the FACE outlet 22 as the 1st outlet and the DEF outlet 23 as the 2nd outlet, is installed side by side by the upper wall which becomes the other end the casing 21 side.
[0034]And the airstream way 24 which opens between an air suction port, and the FACE outlets 22 and the DEF outlets 23 for free passage inside the casing 21 is formed. All over this airstream way 24, the evaporator of the air suction port side to a refrigerating cycle (not shown), The air mix damper 26 which distributes the heat exchanger called the heater 25 which radiates heat in the heat of engine cooling water, the air which passes the heater 25, and the air which bypasses the heater 25 is formed.
[0035]On the flow channel part between the heater 25 and the outlets 22 and 23, and a concrete target, directly under the outlets 22 and 23, The rotary damper-type channel switching arrangement 28 is formed and it enables it to blow off the air in which temperature control was carried out to predetermined by the opening of the air mix damper 26 to the FACE outlet 22 and the DEF outlet 23 empty-vehicle interior of a room.
[0036]This invention is applied to this channel switching arrangement 28. If the structure of this channel switching arrangement 28 is explained, 29 in a figure will be the seal wall which made the approximately semi-cylindrical shape.
[0037]As for the seal wall 29, toward the outlet side, the circle side is arranged so that the opening side may approach with the FACE outlet 22 and the DEF outlet 23 toward the heater 26 side. The periphery of this seal wall 29 is following the peripheral wall of the casing 21, and one, for example, and has interrupted the airstream way 24. That is, integral moulding of the seal wall 29 has been carried out to the casing 1.
[0038]Special arc shape is set to this seal wall 29. The arc shape which specifically passes circle PQR as shown in drawing 3 is made.
[0039]Namely, the double concentric shaft which has penetrated both the wall portions 21a and 21b of the casing 1 as for which circle PQR serves as the heater 25 upper part as is shown in the existing point, for example, drawing 1, and drawing 2 in KESHISHINGU 1 along with the longitudinal direction of the seal wall 29, For example, the three imaginary circle arcs A, B, and C formed of the Mie concentric circle of abbreviation regular intervals centering on the axial center of the driving

shaft 31 (the 2nd) which has inserted in slidably the driving shaft 30 (the 1st) in the air and the driving shaft 30 are drawn, Among these, the point by the side of the end on the outermost circle A, for example, the point used as the end by the side of a FACE outlet, is determined as P point (the 1st point), On the middle circle B, the part used as a central point is appointed at Q point (the 2nd point), the point by the side of the other end on the circle C by the side of the innermost, for example, the point used as the end by the side of a DEF outlet, is determined as R, and it has formed with the circle which passes along these three point PQR.

[0040]That is, circle PQR is making the special shape which intersects the concentric circle arc A, B, and C at each PQR point. In this way, the FACE fresh air inlet 32 (equivalent to the 1st fresh air inlet) is formed in the position which faces the constituted seal wall 29 with the FACE outlet 22, The DEF fresh air inlet 33 (equivalent to the 2nd fresh air inlet) is formed in the position which faces the DEF outlet 23, and the ventilation flue which leads the air which reached the seal wall 29 to the FACE outlet 22 and the DEF outlet 23 is formed.

[0041]And the FACE rotary damper 34 (equivalent to the 1st rotary damper) which opens and closes the FACE fresh air inlet 32 is formed in the outside of this seal wall 29, and, inside, the DEF rotary damper 35 (equivalent to the 2nd rotary damper) which opens and closes the DEF fresh air inlet 33 is formed in it.

[0042]The FACE rotary damper 34 has the circular arc wall 36 with the circular face learned from the arc shape of the outside surface of the seal wall 29 which has the FACE fresh air inlet 32 as shown in drawing 4 (b), The inner surface of this circular arc wall 36 contacts along the outside surface of the seal wall 29, and is shielding the FACE fresh air inlet 32. The damper sealing surface 36a of the circular face close to the outside surface of the seal wall 29 is formed in the inner surface of the circular arc wall 36.

[0043]And the circular arc wall 36 is connected with the driving shaft 30 slidably fitted in the outside surface of the driving shaft 31 via one wall 37 of the casing 21, for example, the end face wall which penetrate the end part of the seal wall 29 slidably, and is prolonged below over the inner surface of the wall portion 21a.

[0044]That is, the FACE rotary damper 34 has supported the center of the Mie concentric circle A, B, and C pivotable as a shaft center. And if the rotary damper 34 which is in a fully closed position according to this damper structure with the lever 38 which is in the end of the driving shaft 30, for example is rotated to an open side, i.e., right-hand side, As shown in drawing 4 (a), according to a difference with the crossing arc shape, concentric circle shape and each part of the Mie same mind. While the damper sealing surface 36a of the rotary damper 34 moves in the direction which deserts the outside surface (lateral surface) of the seal wall 29, carry out rotational displacement to an open position (right side end), and the FACE fresh air inlet 32 is opened wide, If it returns to a fully closed position, it will be made to have been obtained in the action which the damper sealing surface 36a carries out field contact (slide contact) to the outside surface of the seal wall 29 in accordance with the arc shape of the seal wall 29 from the outside, and blockades the FACE fresh air inlet 32.

[0045]The DEF rotary damper 35 has the circular arc wall 39 which has a circular face learned from the arc shape of the inner surface of the seal wall 29 with the DEF fresh air inlet 33, as shown in drawing 4 (b), and the outside surface of this circular arc wall 39 contacts the inner surface of the seal wall 29, and is shielding the DEF fresh air inlet 33. The damper sealing surface 39a of the circular arc shape close to the outside surface of the seal wall 29 is formed in the outside surface of the circular arc wall 39.

[0046]And the circular arc wall 39 is connected with the driving shaft 31 currently supported by the boss section 42 enabling free rotation via the wall 40 of another side of the casing 21, for example, the end face wall prolonged below over the inner surface of the wall portion 29b of the seal wall 29.

[0047]That is, the DEF rotary damper 35 has supported the center of the Mie concentric circle A, B, and C pivotable as a shaft center. And if the rotary damper 34 which is in a fully closed position according to this damper structure with the lever 41 which is in the end of the driving shaft 31, for example is rotated to an open side, i.e., left-hand side, As shown in drawing 4 (c), according to a difference with the crossing arc shape, each part of concentric circle shape and the Mie concentric circle. While the damper sealing surface 39a of the rotary damper 34 moves in the direction which deserts the inner surface (medial surface) of the seal wall 29, carry out rotational displacement to an open position (left side end), and the DEF fresh air inlet 33 is opened wide, If it returns to a fully closed position (right side end), it will be made to have been obtained in the action which the damper sealing surface 39a carries out field contact (slide contact) to the inner surface of the seal wall 29 in accordance with the arc shape of the seal wall 29 from the inside, and blockades the DEF fresh air inlet 33.

[0048]Below, an operation of the air-conditioner for vehicles constituted in this way is explained. Suppose that air was introduced from the air suction port which is not illustrated now. By then, the air mix damper 26 which is in the upstream part of the heater 25 after carrying out heat exchange to the evaporator which this air is fed with the centrifugal fan which is not illustrated, and is not illustrated and being cooled. It is distributed to the air heated by passing the heater 25 (based on heat exchange), and the air which bypasses the heater 25.

[0049]The air shunted toward this cooling air and heated air joins in the airstream way portion of the slipstream of the heater 25, is adjusted to a predetermined temperature, and is introduced in the seal wall 29. And this air by which temperature control was carried out blows off through the channel switching arrangement 28 to various kinds of outlets 22, i.e., a FACE outlet, and the DEF outlet 23 empty-vehicle interior of a room.

[0050]That is, when making temperature control air blow off to the FACE outlet 22 empty-vehicle interior of a room, the RRC of the driving shaft 30 is carried out on a figure from the full-close state of the FACE fresh air inlet 32 shown in drawing 1, drawing 2, and drawing 4 (b).

[0051]Then, rotation displacement of the circular arc wall 36 of the FACE rotary damper 34 which touches external wall surface P_1Q_1 of the seal wall 29 as shown in drawing 4 (b) is carried out a center [the axial center of the driving shaft 30].

[0052]Specifically, rotational displacement of the circular arc wall 36 of the FACE rotary damper 34 is carried out, drawing the direction which separates outside to circle PQR which intersects the concentric circle arc A, B, and C of Mie.

[0053]So, as shown in drawing 4 (a), while the damper sealing surface 36a separates from external wall surface P_1Q_1 of the seal wall 29, rotational displacement of the FACE rotary damper 34 is carried out to an open position.

[0054]Thereby, the air by which the FACE fresh air inlet 32 of the seal wall 29 was in the opened state without the air resistance by the FACE rotary damper 34, and was opened wide, and temperature control was carried out blows off to the FACE outlet 22 empty-vehicle interior of a room through the fresh air inlet 32.

[0055]If the RLC of the driving shaft 30 is shortly carried out on a figure, the damper sealing surface 36a of the FACE rotary damper 32 will return from this position to external wall surface P_1Q_1 of the seal wall 29.

[0056]Since the seal wall 29 is making circle PQR ($P_1Q_1R_1$) which intersects the Mie concentric circle A, B, and C at this time, The locus of tip P_2 of the damper sealing surface 36a which moves in the concentric circle A top crosses at the P_1 point of the seal wall 29 from the outside, and the locus of tip Q_2 of the damper sealing surface 36a which similarly moves in the concentric circle B

top crosses at the Q_1 point of the seal wall 29 from the outside.

[0057]That is, from the method of outside, the damper sealing surface 36a carries out field contact, and sticks the returning FACE rotary damper 34 to the lateral surface of the seal wall 29. Thereby, since the FACE rotary damper 34 in a fully closed position contacts without the crevice between 29 seal wall, the FACE fresh air inlet 32 is closed without a crevice (full close).

[0058]And the FACE rotary bumper 34 stops at the fully closed position, maintains the state which does not have a crevice between the seal walls 29, i.e., the state where there is no wind leak from the FACE fresh air inlet 32, and stops blow off.

[0059]When making temperature control air blow off to the DEF outlet 23 empty-vehicle interior of a room, the RLC of the driving shaft 31 is carried out on a figure from the full-close state of the DEF fresh air inlet 33 shown in drawing 1 and drawing 2.

[0060]Then, rotation displacement of the circular arc wall 39 of the DEF rotary damper 35 which touches the external wall surface QR of the seal wall 29 as shown in drawing 4 (b) is carried out a center [the axial center of the driving shaft 31].

[0061]Specifically, rotational displacement of the circular arc wall 39 of the DEF rotary damper 35 is carried out, drawing the direction which separates inside to circle PQR which intersects the concentric circle arc A, B, and C of Mie.

[0062]So, as shown in drawing 4 (c), while the sealing surface 39a separates from the internal surface QR of the seal wall 29, rotational displacement of the DEF rotary damper 35 is carried out to an open position. Thereby, the air by which the DEF fresh air inlet 33 of the seal wall 29 was in the opened state without the air resistance by the DEF rotary damper 35, and was opened wide, and temperature control was carried out blows off to the DEF outlet 23 empty-vehicle interior of a room through the fresh air inlet 33.

[0063]If the RRC of the driving shaft 31 is shortly carried out on a figure, the damper sealing surface 39a of the DEF rotary damper 35 will return from this position to the external wall surface QR of the seal wall 29.

[0064]Since the seal wall 29 is making circle PQR which intersects the Mie concentric circle A, B, and C at this time, The locus of back end Q_3 of the damper sealing surface 39a which moves in the concentric circle B top like the case of the FACE rotary damper 34, Crossing at Q point of the seal wall 29 from the inside, the locus of tip R_3 of the damper sealing surface 39a which similarly moves in the concentric circle C top crosses at R point of the seal wall 29 from the inside.

[0065]That is, from an inner direction, the damper sealing surface 39a carries out field contact, and sticks the returning DEF rotary damper 35 to the medial surface of the seal wall 29. Thereby, since the DEF rotary damper 35 in a fully closed position contacts without the crevice between 29 seal wall, the DEF fresh air inlet 33 is closed without a crevice (full close).

[0066]And the DEF rotary bumper 35 stops at the fully closed position, maintains the state which does not have a crevice between the seal walls 29, i.e., the state where there is no wind leak from the DEF fresh air inlet 33, and stops blow off.

[0067]Thus, the opening and closing structure using the action of the rotary dampers 34 and 35 which carries out rotational displacement to the circle of the seal wall 29 in the direction which crosses or deserts by adoption. The full-close state which does not have a crevice in the FACE fresh air inlet 32 and the DEF fresh air inlet 33 by direct contact with the seal wall 29 can be maintained.

[0068]As a result, a seal is changed into the state where there is no wind leak, without needing high processing and assembling precision of parts. And since each rotary dampers 34 and 35 rotate without the damper sealing surfaces' 36a and 39a separating from the seal wall 29 thoroughly in the operation process to full admission, and sliding in the rotation 29, i.e., a seal wall, (contact), There is

no addition of frictional resistance, a smooth operation is promised and a smooth drive and operation of each efficient rotary dampers 34 and 35 are attained.

[0069]Simplification of damper structure can be attained by having carried out integral moulding of the seal wall 29 to the casing 1. In addition, since the shank (axis) which supports the FACE rotary damper 34 and the DEF rotary damper 35 pivotable, respectively was constituted from the double concentric shafts 30 and 31 which make a shaft center the center of the Mie concentric circle A, B, and C, simplification of the supporting structure of both the rotary dampers 34 and 35 can be attained.

[0070]Although this invention was applied to the air-conditioner for vehicles which has a FACE outlet and a DEF outlet in one embodiment mentioned above, this invention may be applied to the air-conditioner for vehicles which has the air-conditioner for vehicles which has not only this but the other outlet, for example, FOOT ******** etc.

[Translation done.]

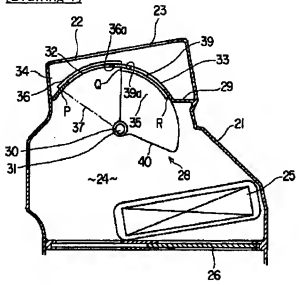
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The sectional side elevation showing the circumference of the channel change structure of the air-conditioner for vehicles concerning one embodiment of this invention.
[Drawing 2]Drawing of longitudinal section of the circumference of the channel change structure.
[Drawing 3]The figure for explaining the arc shape of the seal wall which cooperates with a FACE/DEF rotary damper which constitutes the channel change structure.
[Drawing 4]The figure for explaining the action accompanying opening and closing of the rotary damper of inner, and [to the seal wall of the arc shape] outside.
[Drawing 5]The sectional side elevation for explaining the channel change structure of the conventional air-conditioner for vehicles.
[Drawing 6]Drawing of longitudinal section of the channel change structure.
[Drawing 7]The figure for explaining the structure of the circumference of the rotary damper which constitutes the channel change structure.
[Description of Notations]
21 -- Casing
22 -- FACE outlet (the 1st outlet)
23 -- DEF outlet (the 2nd outlet)
24 -- Airstream way
25 -- Heater (heat exchanger)
29 -- Seal wall
30, 31 -- Driving shaft (double concentric shaft)
32 -- FACE fresh air inlet (the 1st fresh air inlet)
33 -- DEF fresh air inlet (the 2nd fresh air inlet)
34 -- FACE rotary damper (the 1st rotary damper)
35 -- DEF rotary damper (the 2nd rotary damper)
36a, 39a -- Damper sealing surface (circular face)
A, B, C -- Mie concentric circle
P -- The 1st point
Q -- The 2nd point
R -- The 3rd point.

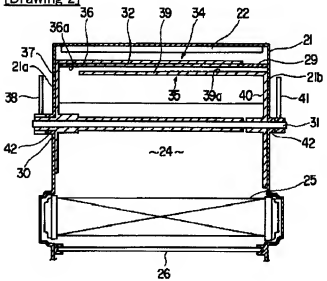
[Translation done.]

DRAWINGS

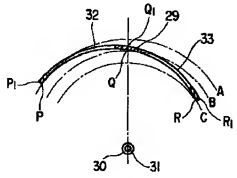
[Drawing 1]



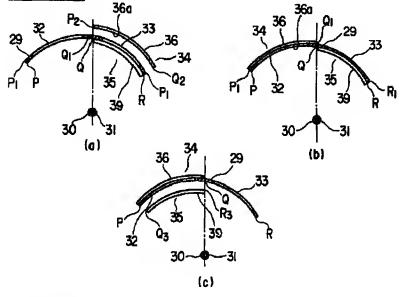
[Drawing 2]



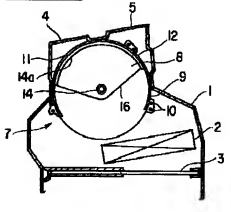
[Drawing 3]



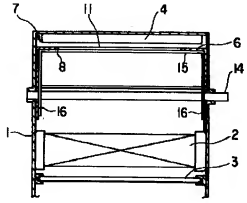
[Drawing 4]



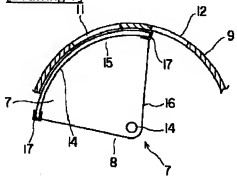
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]